Short Communication

Development of Composite Material Based on Porous Microfibrous Carbon and Zinc Oxide for Energy Storage Application

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The development of efficient energy storage devices is very important challenge for the progress of the renewable energy. One of the promising energy storage systems is the electrochemical capacitor. In this work, the composite material based on porous microfibrous carbon and zinc oxide by electrodeposition technique for electrochemical capacitor was synthesized and characterized. The formation mechanism of zinc oxide on porous microfibrous carbon paper was proposed. This mechanism is constituted of three steps (i) production of OH⁻ ions, (ii) creation of zinc hydroxide Zn(OH)₂, (iii) transformation of zinc hydroxide Zn(OH)₂ to zinc oxide ZnO. The composite materials based on a porous microfibrous carbon paper and zinc oxide were studied by cyclic voltammetry and the electrochemical impedance. The synthesized electrodes show a good capacitive behavior. The electrodeposition time of 60 minute allows the formation of excellent electrode for electrochemical capacitor.

Keywords: Energy storage; electrochemical capacitor; zinc oxide; porous carbon

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